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Patented June 24, 1902.

A. KNELL, JR.

WATER CLOSET FLUSHING TANK OR CISTERN.

(Application filed Jan. 25, 1902.)

(No Model.)

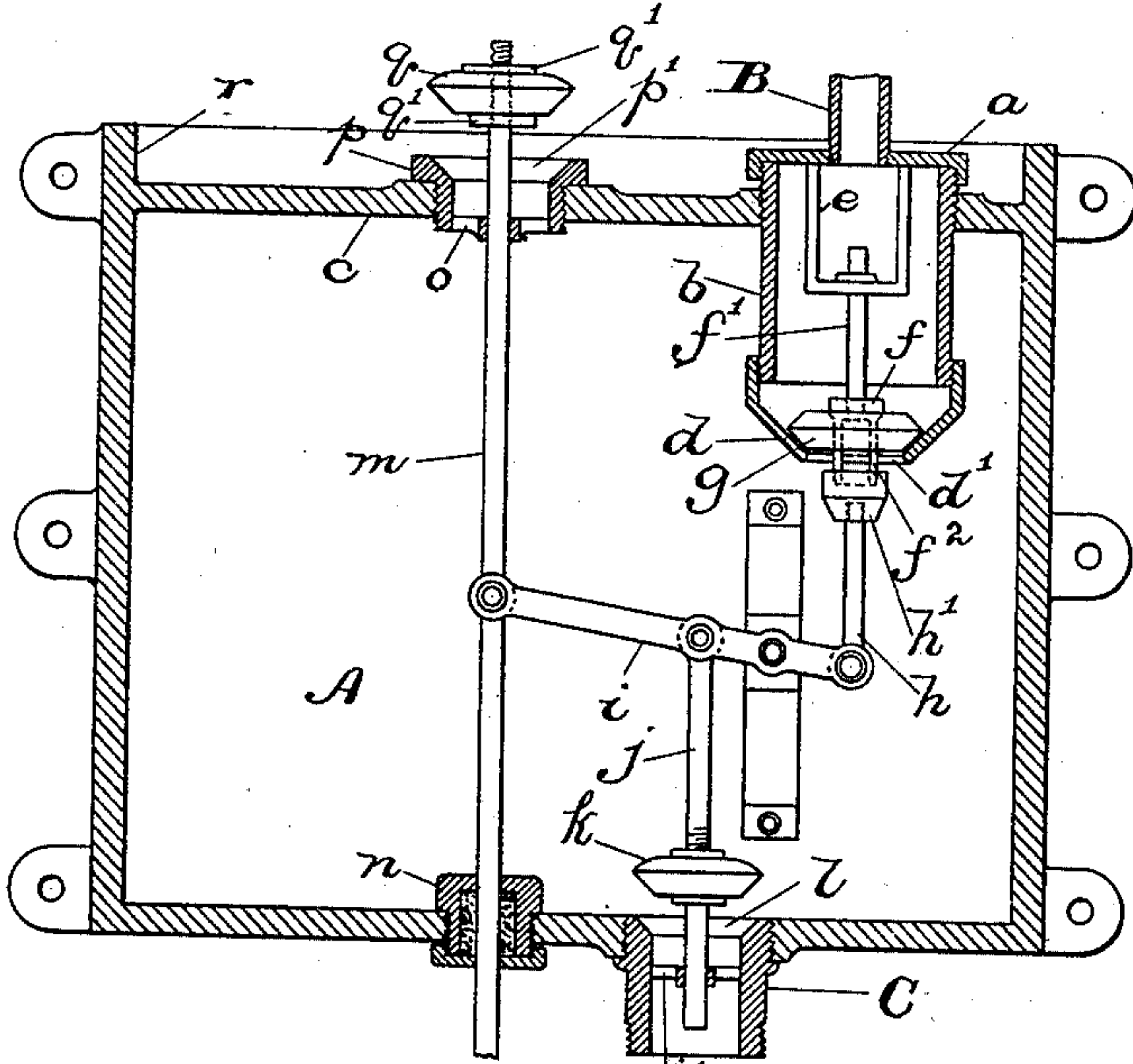


Fig. 1.

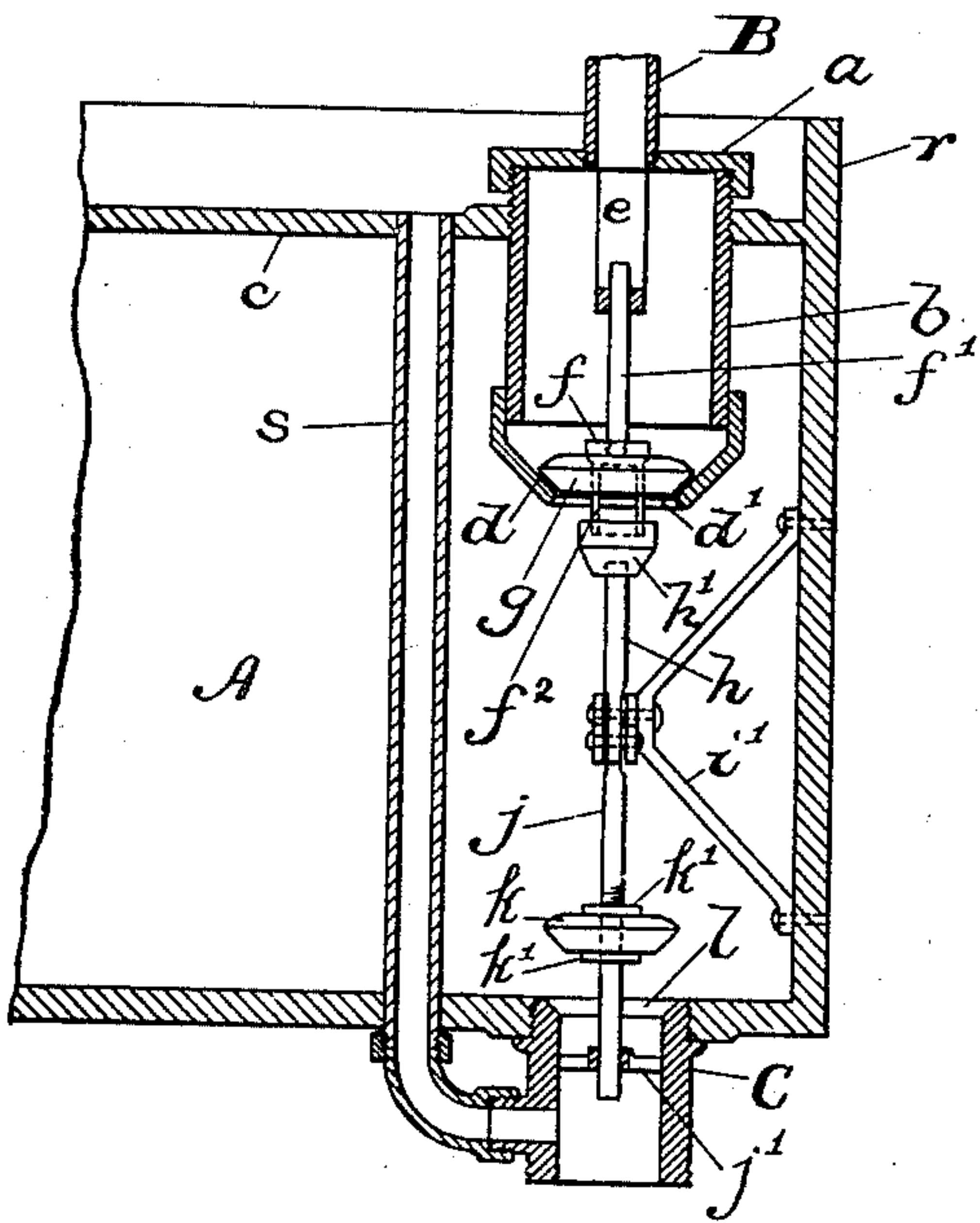


Fig. 2.

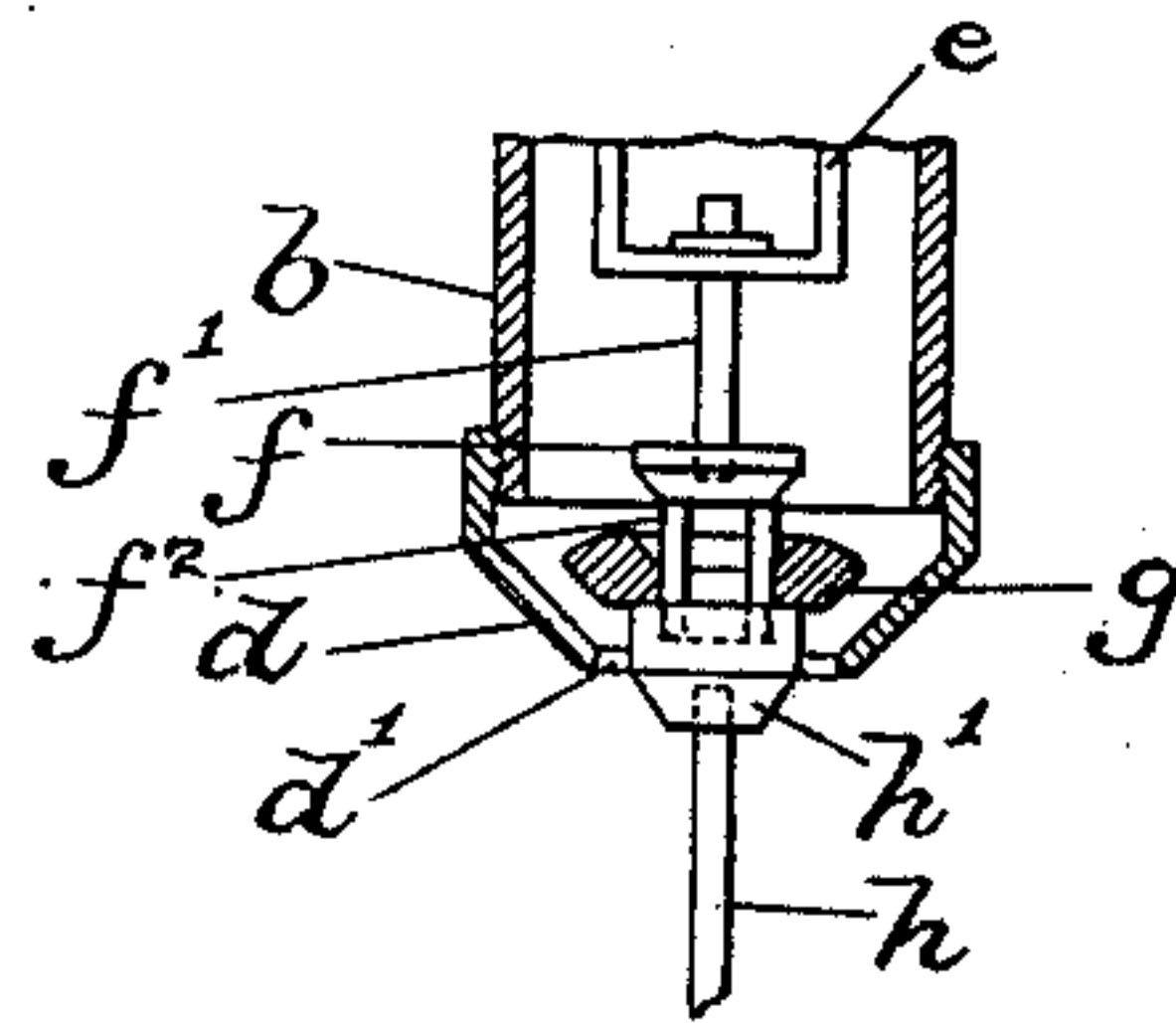


Fig. 3.

Witnesses:  
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# UNITED STATES PATENT OFFICE.

ANDREW KNELL, JR., OF BALTIMORE, MARYLAND.

## WATER-CLOSET FLUSHING TANK OR CISTERN.

SPECIFICATION forming part of Letters Patent No. 703,136, dated June 24, 1902.

Application filed January 25, 1902. Serial No. 91,198. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW KNELL, Jr., a citizen of the United States, residing at Baltimore, State of Maryland, have invented certain new and useful Improvements in Water-Closet Flushing Tanks or Cisterns, of which the following is a specification.

This invention relates to water-closet flushing tanks or cisterns; and one object of the invention is to provide improved valve mechanism that will act in a positive manner to control the supply of water to the tank and the discharge of water therefrom without the use of any float device or similar device depending upon the action of the water itself, which are so liable to get out of order.

With this and other objects in view the invention consists in certain constructions and combinations of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of my improved water-closet flushing-tank. Fig. 2 is a similar view in which the section is taken approximately at right angles to Fig. 1. Fig. 3 is a detail view of the supply-valves in raised position.

Referring to the drawings by letters, A designates a closed tank adapted for attachment to the wall above the water-closet basin, and this tank is both air and water tight with the exception of its valve-openings.

B designates the water-supply pipe, intended to be connected to any suitable source of supply, and C the discharge-pipe, intended to convey the water from the tank to the closet-basin.

The supply-pipe B is secured in the cover *a* of a valve-casing *b*, held in the top *c* of the tank A and extending within the latter, and at its lower end said casing *b* is contracted to form a beveled valve-seat *d*, provided with a port *d'*, which opens into the tank. Within and at the upper end of said casing *b* is rigidly secured an open-frame bearing *e*, and a valve-stem *f'* is mounted to move freely up and down in said bearing *e* and at its lower end has a puppet-valve *f*, which is adapted to seat itself within a main valve *g*, which in this instance is ring-shaped and is adapted to rest on said valve-seat *d* to close the latter. The puppet-valve *f* is auxiliary to the main

valve *g* and serves to relieve the water-pressure on the main valve when the latter is about to be opened. This auxiliary valve has a downwardly-extending shank *f<sup>2</sup>*, which extends loosely through the main valve *g*, and the lower end of said shank is secured to the upper shouldered end *h'* of a lever-rod *h*, whose lower end is pivotally connected to the short arm of a lever *i*, fulcrumed on a bracket *i'*, secured to the side of the tank A. The shank *f<sup>2</sup>* of the auxiliary valve *f* is of such length that when the said lever *i* is vibrated so as to move its short arm upwardly the auxiliary valve, which is rigid on its rod *h*, will be lifted off its seat in the main valve *g* before the latter valve is opened. This action is due to the fact that said rod *h* has a limited movement independent of the main valve, and the auxiliary valve is raised off its seat by contact of the shouldered upper end of said rod. The main valve *g* and auxiliary valve *f* together constitute the supply-valve. To the long arm of said lever *i*, but near the fulcrum thereof, is secured a pendulous valve-rod *j*, working at its lower end through a spider-bearing *j'* in the discharge-pipe C, and a discharge-valve *k* is secured on said rod and is adapted to open and close said discharge-pipe.

To the extremity of the long arm of the lever *i* is pivoted a vertical pull-rod *m*, which in the present instance extends downwardly through a stuffing-box *n* in the bottom of the tank A and is intended to be connected to a pivoted water-closet seat, (not shown,) so that said rod *m* will be pulled downwardly when said seat is occupied and be automatically raised to an upward position when the seat is unoccupied. The arrangement of seat here referred to is a common and well-known one, which it is not deemed necessary to illustrate nor describe, as it is no part of this invention. The upper end of said pull-rod *m* works through a spider-bearing *o* in an air-vent valve-casing *p*, secured to the top *c* of the tank, and above or outside of the tank said pull-rod is provided with an air-vent valve *q*, adapted to be seated on the valve-seat *p'* in said casing. The tank A is provided, as indicated in the drawings, with a flange *r*, extending upwardly above and all around the top *c*, whereby to form a safety water-trough,



and an open pipe *s* (see Fig. 2) extends from said trough down through the tank and has its lower end connected with the discharge-pipe *C*.

5 When the water-closet is not in active use, the weight of water in the supply-pipe *B* and valve-casing *b*, above the supply-valve *f g*, holds said valve to its seat, and accordingly the air-vent valve *q* and discharge-valve *k* 10 are both held off their seats or open. Hence in this condition there is no water in the tank. When the pull-rod *m* is moved downwardly and held firmly in downward position by a person occupying the seat, both the discharge- 15 valve *k* and air-vent valve *q* are tightly closed and the water-supply valve will be open, so that water can flow into the tank, but cannot flow therefrom. The air-vent valve *q* being 20 held closed the water will continue to flow into the tank *A* until the pressure of air confined and compressed at the upper end of the tank equals the pressure of the water, when no more water will flow into the tank. Finally, when the pull-rod *m* is moved up- 25 wardly the air-vent valve will be opened, together with the water-discharge valve *k*, and the water in the tank will flush the basin, while at the same time, as is evident, the supply-valve *f g* will be automatically closed. 30 The valves *k* and *q* can be adjusted on their rods by means of nuts *k'* and *q'*.

It is to be noted that the independent movement of the auxiliary valve *f* with respect to the main valve *g* relieves the pressure of the 35 water on said main valve, so that the latter valve can be more easily raised when the shoulder *h'* of the valve-rod comes into contact therewith.

If the air-vent valve *q* should at any time 40 leak and the inflowing water rise on the tank to such an extent as to flow over the top *c*, the trough formed by the upward flange *r* will prevent it from spilling or overflowing and it will flow into the safety-pipe *s* and 45 thence into the discharge-pipe *C*.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a tank provided with 50 an inlet and an outlet for water; a supply-valve governing said inlet, and comprising a

main valve, and an auxiliary valve having a limited movement independent of said main valve; a discharge-valve adapted to govern the water-outlet; a lever adapted to move 55 both the supply-valve and discharge-valve; an air-vent valve adapted to close the tank and make the same air-tight whereby the water flowing in the tank will compress the air at the upper part of said tank; and a connection 60 between said air-vent valve and said lever.

2. The combination of a tank provided with a water-inlet and a water-outlet; a supply- 65 valve for governing said water-inlet; a discharge-valve for governing said water-outlet; a lever connected to both of said valves and arranged to open one when it closes the other; an air-vent valve adapted to close the tank 70 and make the same air-tight whereby the water flowing into the tank will compress the air at the upper part of the tank; and a connection between said air-vent valve and said lever adapted to close said air-vent valve when 75 the supply-valve is open and the discharge-valve is closed, and adapted to open said air-vent valve when the supply-valve is closed and the discharge-valve is open.

3. The combination of a tank provided with an inlet and an outlet for water; a supply- 80 valve for governing said inlet and comprising a ring valve, and a puppet-valve adapted to be seated on said ring valve and provided with a shank extending therethrough; a valve-rod rigidly secured to said shank and 85 provided with a shoulder adapted to contact with said ring valve to raise the same; a lever having one arm connected to said valve-rod; a discharge-valve adapted to govern the water-outlet and pendulous from the other 90 arm of said lever; an air-vent valve adapted to close the top of said tank; and a pull-rod carrying said air-vent valve and connected to the last-named arm of said lever and extending through the bottom of the tank. 95

In testimony whereof I affix my signature in the presence of two witnesses.

ANDREW KNELL, JR.

Witnesses:

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